Bacterial oligomers and polymers play opposite roles

MAMPs interact with each other and with host cell walls during induction of calcium signalling, which is supressed by bacterial EPS

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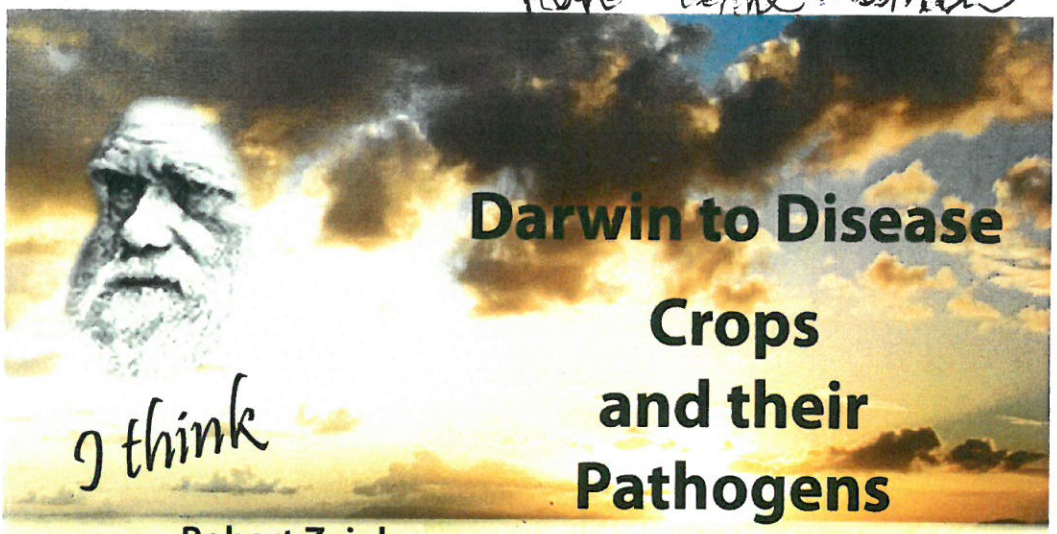
Publication date:
2009

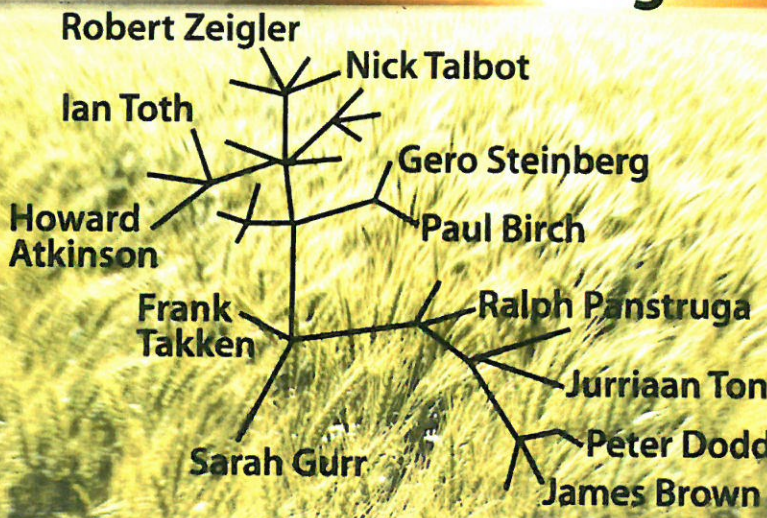
Document version
Publisher's PDF, also known as Version of record



Darwin to Disease

Crops and their Pathogens

I think



British Society for Plant Pathology Presidential Meeting

Tuesday 22nd September 2009
Museum of Natural History Oxford UK

BSPP

to symplast is a prerequisite for defence responses and is prevented or reduced by EPS produced by diverse pathogens in the apoplast (Aslam et al., 2008. Curr. Biol. 18, 1078). For example, polyanionic xanthan from *Xanthomonas campestris* chelates Ca^{2+} ions and amounts of xanthan produced in the infected apoplast are well in excess of that required to deplete this key calcium pool. EPS-defective mutants are non-pathogenic and trigger host defences much more than wild type, and pure xanthan prevents calcium influx and consequent defences triggered by EPS- mutants or by MAMPs. Clearly, induction and suppression of innate immunity involves complex interactions between pathogen and host polymers

Bacterial oligomers and polymers play opposite roles: MAMPs interact with each other and with host cell walls during induction of calcium signalling, which is suppressed by bacterial EPS.

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Bacterial MAMPs are mostly conserved surface polymers released *in planta* as complex mixtures along with endogenous oligogalacturonan elicitor (OGA). We studied the early responses in *Arabidopsis* of calcium influx and oxidative burst elicited by non-saturating concentrations of bacterial MAMPs and OGA, used alone and in combination. This revealed that some MAMPs have additive and even synergistic effects, while some mutually interfere. The small peptide elicitors derived from flagellin (flg22) and elongation factor are potent at sub-nanomolar levels, whereas peptidoglycan and lipopolysaccharide (LPS) only at high micromolar levels induce low and late host responses in plant cells. This contrast seems to result from restricted access through the plant wall matrix of these macro- or supramolecular MAMPs. Flg22 is restricted by ionic effects, yet rapidly permeates a cell wall matrix, whereas LPS, which forms micelles, is severely constrained, presumably by molecular sieving (Aslam et al., 2009. Mol. Plant Pathol. 10, 375). Most bacteria require extracellular polysaccharides (EPS) for virulence. Calcium influx from the apoplast